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THIRD ALL-UNION CONFERENCE ON THE ELECTROPHYSIOLOGY OF THE NERVOUS SYSTEM

-USSR-

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The Third Conference on the Electrophysiology of the Nervous System and the Sumposium on "Fundamental Problems of the Electrophysiology of the Central Nervous System" were held in Kiev 27 June-2 July 1960. The two were organized by the Institute of Physiology imeni A. A. Bogomolets of the Ukrainian SSR Academy of Sciences, jointly with the All-Union Physiological Society imeni Pavlov and the Institute of Animal Physiology of the Kiev University.

The conference was attended by about 600 persons, including 300 physiologists from Moscow, Leningrad, Tbilisi, Yerevan, Gor'kiy, Odessa, Vil'nyus, Karanganda, and other cities of the Soviet Union. Owing to the large number of applications for submission of reports, the conference was organized into three parallel sections to permit the participants to hear the maximum number of reports. This arrangement enabled the conference participants to hear 144 more urgent reports; the remaining ones were published in conference abstracts.

The conference was opened with a plenary session devoted to the basic problems of electroencephalography. Prof A. F. Makarchenko gave a brief introductory address. The address was followed by the report: "Some Notes on the Neurophysiological Significance of Electric Phenomena of the Cerebral Cortes," delivered by Prof P. K. Anokhin. Rapt attention greeted Prof N. V. Golikov's report: "Synchronization of Slow and Fast Potentials as an Index of Nerve Cell Reactivity and Excitability," and Prof F. N. Serkov's report: "Genesis of the Alpha-Rhythm."

During the conference there were held 15 sectional sessions and one plenary session devoted to electrophysiological research methods. A report entitled "Electrotonus as a Membrane Process" was delivered by one of the oldest electrophysiologists of our country, Prof D. S. Vorontsov, at the "Nature of Bioelectric Potentials" session. Making use of personal findings as well as literary

data, D. S. Vorontsov showed that the membrane is most closely linked with the cell's metabolic system, maintaining the membrane's potential and regulating its stability. Electrotonus constitutes an extremely sensitive means for understanding a number of cellular processes. Major interest was evoked also by the reports delivered by G. A. Kurell, Ye. A. Liberman and L. M. Tsofina, and M. F. Shuba. Note should be taken of G. Yu. Belitskiy's report: "Analysis of Bioelectric Characteristics of Living Tissues," which was delivered at the session devoted to the electrophysiology of the nerve fiber and nerve-muscular transmission. The reporter believes that the physiological properties of tissues must not be assigned to the constant values of such characteristics as electric resistance, potential, and capacity. M. F. Korzon and S. A. Chepurnyy's report: "Functional Characteristics of the Calmar Giant Axon" and N. M. Shamarina's report: "Mechanism of the Synaptic Conduction Block in N. Ye. Vvedenskiy's Inhibition" were attentively received. One of the central reports delivered at the session devoted to the electrophysiology of afferent and efferent tracts in the nervous system was that of Prof M. G. Udel'nov, G. N. Arkhipova, and G. Ye. Samonina: "Certain Mechanisms of the Bioelectric Activity of the Vegetative Nervous System." The authors have obtained data enabling them to clarify the quantitative relationship existing between the efferent and afferent activity of vegetative reflex tracts. The session devoted to the evoked potentials of the cortex of the cerebral hemispheres and cerebellum heard with interest the report of Professors N. N. Dzidzishvili and T. D. Dzhavrishvili: "Problems of the Cortical Electric Activity in Ontogenesis." New data on the electrophysiology of receptors and sensors were supplied in Prof G. V. Gershuni's report: "Investigations into the Central Influences Which Modify the Activity of the Auditory System's Peripheral Neuron." The reporter cited data showing that a drop in the amplitude of total electric response of auditory nerve fibers is conditioned by influences originating in the central nervous system and transmitted to the cochlea along the central fibers of the olivary-cochlear tract, or along some other efferent fibers. Of the reports devoted to the electric activity of the cortex of cerebral hemispheres in conditioned reflex function, we shall note the report of Professors M. N. Livanov, N. A. Gavrilova, and G. I. Shul'gina entitled: "Local Changes in the Bioelectric Mosaic of Cerebral Cortex Induced by the Development of the Conditioned Motor Reflex," and the report of Professors L. G. Trofimov and N. N. Lyubimov: "Study of the Potentials of Various Brain Structures in Development of Conditioned Reflexes to Rhythmic Sound and Light Stimulations." A large number of reports dealt with the electrophysiology of the brain stem, electrophysiology of the spinal cord, general problems of electroencephalography, and with the electroencephalogram of man in normal and clinical electroencephalography. We should mention Professors A. F. Makarchenko's and N. L. Gorbach's report: "Desynchronization and Reduction in Electric Activity of Human Brain in Certain Physio-

logical and Pathological Conditions." The data obtained by them show a definite connection between low-amplitude variations in EEG and the diencephalic and subcortical disturbances. The authors are of the opinion that we must not regard all low-amplitude EEGs from the standpoint of desynchronization originating as a result of non-specific activation of the cerebral hemispheres' cortex by the reticular formation of the brain stem. The examination of correlation features in stimulation and inhibition processes at different stages of ontogenesis, as supplied in Prof V. S. Sheveleva's report: "Mechanisms of Development of Stimulation and Inhibition in the Nervous System in Ontogenesis When Receptors are Stimulated" contributes to the understanding of pathological reactions in the organism arising from the application of extremely powerful stimulations.

A special symposium was convened in order to provide the opportunity for a profound discussion of the fundamental theoretical problems of electrophysiology of the central nervous system. Leading electrophysiologists of the Soviet Union, Professors V. S. Rusinov and M. N. Livanov, presided over its sessions. The first session heard Prof P. G. Kostyuk's report: "Electrophysiology of the Neuron," which examined the problems dealing with the analysis of general properties of and differences in the electric activity of individual neurons. P. G. Kostyuk devoted particular attention in his report to the nature of polarization and electric activity of the nervous system, to the mechanism of synaptic action, the mechanism of generation of radiating stimulation within the cell, and the inhibition mechanism. The second and third sessions heard the reports of Prof A. I. Roytbak, "Evoked Potentials of the Cortex of Cerebral Hemispheres," and Docent Ye. N. Sokolov, "Mechanisms of the Phonal Rhythm of the Cortex of Cerebral Hemispheres." Owing to the keenness of discussion problems raised at the sessions and the advance familiarization of the symposium participants with the text of reports, there unfolded a lively discussion which revealed both the positive aspects and the shortcomings of the basic theories regarding the origin of bioelectric potentials, the mechanisms of the rhythmic electric activity of cerebral hemispheres, the nature of various phases of primary responses by the cortex, and a number of others.

The conference and the symposium helped to examine critically the experimental material obtained in recent years in USSR laboratories on the electrophysiology of the nervous system, to coordinate significantly the activities of various laboratories working in this area, and to map further avenues of progress of Soviet electrophysiology.

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